

Amendment to the Claims:

1. (Previously Presented) A method of tomographic imaging, and particularly a CT or MR method, for repetitively producing diagnostic slice images of a part of a patient's body, having the following method steps:

5 a) making of current reference slice images of the part of the body,

b) determination of a geometrical transformation by which the current reference slice images are brought into agreement with earlier reference slice images of the part of the body,

10 c) calculation of current imaging parameters by transforming earlier imaging parameters by means of the geometrical transformation (determined in step b),

d) making of a current diagnostic slice image, the position and orientation in three dimensions of the image plane of the diagnostic slice image being determined by the current imaging parameters (calculated in step c),

15 wherein there are made in step a) of the method at least two current reference slice images whose image planes are preset in such a way that their relative positions and orientations in three dimensions agree with the relative positions and orientations in three dimensions of the earlier reference slice images, and in that the geometrical transformation (is determined in step b) in such a way that, by it, all the
20 current reference slice images are brought into agreement with the corresponding earlier reference slice images simultaneously.

2. (Currently Amended) ~~[[A]]~~ The method as claimed in claim 1, wherein determining the geometrical transformation (is determined in step b) ~~of the method by includes:~~

5 identifying reference points in the current reference slice images that agree with corresponding reference points in the earlier reference slice images.

3. (Currently Amended) ~~[[A]]~~ The method as claimed in claim 1, wherein the geometrical transformation (determined in step b) of the method is a rigid or an affine transformation that is defined by a set of transformation parameters, the set of transformation parameters being determined automatically
5 ~~[[by,]]~~ by means of a suitable algorithm, optimizing a measure of similarity that represents the similarity of the current reference slice images to the corresponding earlier ones.

4. (Currently Amended) ~~[[A]]~~ The method as claimed in claim 1, wherein a plurality of ~~parallel~~ reference slice images ~~[[()]]~~ are parallel and are made in each of ~~[[the]]~~ a head-foot, anterior-posterior and right-left directions ~~in step b) of the method,~~ the image resolution being ~~selected to be higher in the image planes than perpendicularly thereto~~ two of the slice image directions that in a third of the slice image directions.

5. (Currently Amended) A computer-readable medium carrying a computer program for performing the which controls a computer to perform a method claimed in claim 1, which automatically determines imaging parameters by which ~~[[the]]~~ a position and orientation in three dimensions of ~~[[the]]~~ an image plane
5 of a diagnostic slice image are determined, ~~so doing by the method comprising:~~

a) ~~receiving current image data for at least two~~ current reference slice images and ~~earlier image data for at least two~~ earlier reference slice images as an input,

b) determining a geometrical transformation by which the at
10 least two current image data is reference slice images are simultaneously brought into agreement alignment with the at least two earlier image data reference slice images,

c) calculating ~~[[the]]~~ current imaging parameters by transforming earlier imaging parameters by the geometrical transformation (determined in step b), and

15 ~~wherein the input in step a) comprises current and earlier image data for, in each case, at least two current and earlier reference slice images, and in that, in~~

step b), the geometrical transformation brings the image data for all the current reference slice images into agreement with the image data for the corresponding earlier reference slice images simultaneously, a set of transformation parameters defining the geometrical transformation being determined by, by means of a suitable optimizing algorithm, maximizing a measure of similarity that represents the similarity of the current image data to the corresponding earlier image data

d) controlling an imager using the current imaging parameters to generate a current diagnostic image.

6. (Currently Amended) A tomographic imaging unit having system comprising:

an image-making means that make diagnostic slice images;[[,]]

and having a computer that operates the image-making means and for this purpose calculates imaging parameters that determine [[the]] particular positions and orientations in three dimensions of [[the]] image planes of [[the]] diagnostic slice images made by the image-making means, the computer being programmed to perform the steps of:

receiving at least two earlier reference slice images having a first position and orientation relative to each other which at least two earlier reference images were made using earlier imaging parameters;

controlling the image-making means to make at least two current reference slice images which have the first position and orientation relative to each other;

calculating a geometric transform that transforms both of the at least two current reference images and both of the at least two earlier reference images into alignment with each other;

operating on the earlier imaging parameters with the calculated geometric transform to generate current imaging parameters;

controlling the image-making to generate a current diagnostic slice image using the current imaging parameters

~~characterized in that the computer is so set up in respect of software that the making of the diagnostic slice images takes place by the method claimed in claim 1.~~

7. (New) The computer-readable medium as claimed in claim 6, wherein determining the geometrical transform further includes:

with a computer algorithm, maximizing a similarity measure that represents a similarity between the current reference slice images and the earlier
5 reference slice images.

8. (New) The tomographic imaging system as claimed in claim 6, wherein

the at least two earlier reference slice images include at least two earlier reference slice images oriented in parallel along each of two orthogonal
5 directions, and

the at least two current reference slice images include at least two current reference slice images oriented in parallel along each of two orthogonal directions.

9. (New) The tomographic imaging system as claimed in claim 8, wherein a resolution of the earlier and current reference slice images oriented along one of the two orthogonal directions is different from a resolution of the earlier and current reference slice images oriented along another of the two orthogonal
5 directions.

10. (New) An imaging system for the production of diagnostic slice images of a patient, the system comprising:

an imaging unit which makes at least two current reference slice images of the patient, the current reference slice images being preset in such a way
5 that their relative positions and orientations in three dimensions coincide with the relative positions and orientations in three dimensions of earlier reference slice images of the patient;

a transform unit configured to determine a geometrical transformation which aligns the current reference slice images and the earlier reference slice images;

- 10 a computer configured to automatically calculate current imaging parameters by transforming earlier imaging parameters by the geometrical transformation and to operate the imaging unit using the current imaging parameters to set a position and orientation of an image plane in three dimensions and to generate a diagnostic slice image in the image plane.

11. (New) The system as claimed in claim 10, wherein the geometrical transformation is one of a rigid and an affine transformation defined by a set of transformation parameters, the set of transformation parameters being determined automatically by a suitable algorithm which optimizes a measure that
5 represents a similarity of the current reference slice images to the corresponding earlier reference slice images.

12. (New) The system as claimed in claim 10, wherein the earlier and reference slice images each include at least two reference slice images oriented parallel to the image plane and at least two reference slice images oriented perpendicular to the image plane.

13. (New) The system as claimed in claim 12, wherein the earlier reference slice images and the current reference slice images each include at least two reference slice images oriented in a head-foot direction, an anterior-posterior direction, and a right-left direction.

14. (New) The system as claimed in claim 12, wherein the earlier reference slice images and current reference slice images oriented parallel to the image plane have a higher image resolution than the earlier and reference slice images oriented perpendicular to the image plane.